

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1 and 3-29 are pending in this case. Claims 8-17 are withdrawn. Claim 2 is canceled without prejudice or disclaimer, Claims 1 and 3-7 are amended, and new Claims 18-29 are added by the present amendment. Amended Claims 1 and 3-7 and new Claims 18-29 are supported by the original claims, specification, and drawings.¹ Amended Claims 1 and 3-7 and new Claims 18-29 add no new matter.

In the outstanding Office Action, Claims 3, 6, and 7 were rejected under 35 U.S.C. §112, second paragraph, as indefinite. Claims 1-7 were rejected under 35 U.S.C. §102(b) as anticipated by Yasuda et al. (U.S. Patent No. 5,972,276, herein "Yasuda"). Claims 1-7 were rejected under 35 U.S.C. §102(b) as anticipated by Asai (U.S. Patent No. 5,545,365).

The abstract is amended to remove element numbers and correct a misspelling, placing the abstract in conformance with United States patent practice.

With regard to the rejection of Claims 3, 6, and 7 under 35 U.S.C. §112, second paragraph, as indefinite, Claims 3, 6, and 7 are amended to provide antecedent basis for all terms. Accordingly, Claims 3, 6, and 7 are believed to be in full compliance with all requirements under 35 U.S.C. § 112, second paragraph.

With regard to the rejection of Claim 1 under 35 U.S.C. §102(b) as anticipated by Yasuda or Asai, the rejection is respectfully traversed in light of the amendments presented herewith.

The claims as currently written include a resin molding device having an outside air inlet part located in a stepped portion of an inner wall of a metal mold. The outside air inlet part is located on a non-transfer face of the mold. As described in the specification, this

¹ See e.g. Specification at page 22, lines 3-20, page 26, lines 12-15, page 35, lines 12-21, and Figures 1 and 2.

means that the outside air inlet part is located in a face that is not required to remain flush with the surface of the resin. The resin does not need to acquire the surface characteristics of the mold on a non-transfer face. In contrast, a transfer face of the mold is intended to remain in contact with the resin throughout the molding process, so that the resin surface acquires the characteristics of the transfer face (i.e. surface roughness or other features). For example, Figure 33 shows a mold with gear teeth 51c on a transfer face of mold 50. The resin must stay in contact with the transfer face of mold 50 throughout the molding process to properly form teeth 51c.

The outside air inlet part is configured to create a sink in the surface of the resin proximate the end portion of the outside air inlet part. This causes the sink to cool the slowest, which helps prevent the resin from receding from the transfer face as it cools. For example, without an outside air inlet part, the resin in the middle of the part will cool the slowest, and as it finally cools, it will shrink. As the shrinking sink is in the center of the part, it will pull on all the resin around it as it shrinks. Accordingly, sink 101 can be formed in what should be a transfer surface of the part, as shown in Figure 25. In contrast, the outside air inlet part creates a sink in a non-transfer portion of the resin part. The sink cools even after the middle portion of the part, as it is in contact with air rather than the mold surface (the mold surface is a much better heat conductor than air). Since the center of the resin cools before the sink, the center does not pull the resin away from the transfer face. Thus, a resin mold made according to the present invention can prevent a sink from forming on a transfer surface of the resin part.

Accordingly, amended independent Claim 1 recites a resin molding device comprising:

a metal mold with a cavity; and
an outside air inlet part formed in said metal mold and
opened to an optional part of said cavity to allow the outside of
said metal mold to communicate with an interior of said cavity,

and a stepped part formed at an inner wall of said cavity of said metal mold orthogonally to the flowing direction of said molten resin injected into the cavity, an opening of said outside air inlet part to the cavity being opened at a portion of said stepped portion other than a transfer face of the cavity.

Yasuda describes a resin mold 1 having a gas-release passage 3 in a transfer face 2a.

Resin mold 1 further includes hole 11 formed in mold portion 1b. Hole 11 is not formed at a portion of a stepped portion. It is respectfully submitted that Yasuda does not teach “an opening of said outside air inlet part to the cavity being opened at a portion of said stepped portion other than a transfer face of the cavity,” as recited in Claim 1. Accordingly, it is respectfully submitted that Claim 1 is not anticipated by Yasuda, and is patentable thereover.

Asai describes a mold for making discs. Asai explicitly teaches that the face of the disc proximate the ends of ejector sleeve 24 and gate cutter 25 is a transfer face, as the device disclosed by Asai is configured to make a disc with a square cornered hole. Thus, in contrast to the claims, outlet 29 is an outlet in a transfer face. It is respectfully submitted that Asai does not teach “an opening of said outside air inlet part to the cavity being opened at a portion of said stepped portion other than a transfer face of the cavity,” as recited in Claim 1. Accordingly, it is respectfully submitted that Claim 1 is not anticipated by Asai, and is patentable thereover.

Claims 2-7 and 18-29 are dependent from Claim 1, which applicants respectfully submit is patentable. Thus, Claims 2-7 and 18-29 are also believed to be patentable.

Accordingly, the outstanding rejections are traversed and the pending claims are believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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